

Application Number 10/693,011  
Responsive to Office Action mailed May 7, 2007

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**REMARKS**

This Amendment is responsive to the Office Action dated May 7, 2007. Applicant has amended claims 1, 3, 10, 23, 25 and 28. Claims 1-10, 21 and 23-32 are pending. In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration and withdrawal of the rejections set forth in the Office Action dated May 7, 2007.

**Claim Rejection Under 35 U.S.C. § 112**

In the Office Action, claims 1-10, 21, and 23-32 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Office Action found that claims 1 and 23 are a listing of parts and not a system because there is no relationship between the listed elements. With the present Amendment, Applicant has amended claims 1 and 23 to more clearly relate the elements recited in the claims to each other. For example, claim 1 now recites, in part, an internal antenna mounted on a first circuit board within a programmer housing and a display device mounted on a second circuit board within the programmer housing. Claims 2-10 and 21 are dependent on claim 1, and claims 24-32 are dependent on claim 23.

Claims 3, 10, and 25 were rejected on the basis that particular limitations lacked sufficient antecedent basis. Applicant has amended claims 3, 10 and 25 to provide correct antecedent basis for each recited element.

Applicant submits that claims 1-10, 21, and 23-32 as amended particularly point out and distinctly claim the subject matter, as required by 35 U.S.C. § 112, second paragraph. Withdrawal of the rejection is respectfully requested.

**Claim Rejection Under 35 U.S.C. § 103(a)**

The Office Action rejected claims 1-4 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Nelson et al. (U.S. Patent No. 6,418,346, hereinafter Nelson) in view of Maoz et al. (U.S. Patent Application Publication No. 2004/0125029, hereinafter Maoz). In addition, claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Stein et al. (U.S. Patent Application Publication No. 2004/0230246, hereinafter Stein). Claims 5-8, 23-29 and 32 were

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rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Carbunaru et al. (U.S. Patent Application Publication No. 2004/0098068, hereinafter Carbunaru). Claims 30 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz in view of Carbunaru as applied to claim 23 above, and further in view of Stein.

Applicant respectfully traverses these rejections. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

***Claims 1-10 and 21***

For example, Nelson in view of Maoz fails to disclose or suggest a programmer for an implantable medical device that includes an internal antenna mounted on a first circuit board within a programmer housing and a display device mounted on a second circuit board within the programmer housing, where the first circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps, as recited by Applicant's claim 1, as amended.

The Office Action characterized Nelson as disclosing a programmer for an implanted medical device with a telemetry antenna on an antenna driver circuit board and a display screen on a graphics circuit. As recognized by the Office Action, Nelson does not teach or suggest, among other things, an internal antenna or a substantially contiguous ground plane layer interrupted by a plurality of gaps. The Office Action looked to Maoz to overcome the deficiencies in Nelson, and asserted that Maoz discloses an internal antenna 10, a ground plane layer, and a plurality of gaps (53a, 53b in FIG. 5a). The Office Action reasoned that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the programmer as taught by Nelson, with a programmer having an internal antenna and gaps on the circuit board as taught by Maoz, since such a modification would provide the programmer with an internal antenna and a ground plane layer that is disrupted by gaps for providing increased power without internal noise.

Applicant respectfully disagrees with the Office Action's conclusion of obviousness of claim 1. Even if the teachings of Nelson and Maoz were combined, the resulting combination would not meet each and every limitation of Applicant's independent claim 1. For example, both

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Nelson and Maoz fail to teach or suggest the particular structural arrangement required by Applicant's claim 1. The Office Action found that Nelson teaches an external telemetry antenna on an antenna driver circuit board, and referred to column 11, lines 52-55 to support the assertion, and a display screen on a graphics circuit. However, the Office Action failed to explain or provide support for the claim requirement that an antenna is mounted on a first circuit board, and that the display screen is mounted on a second circuit board, separate from that of the antenna. Nelson does not teach such an arrangement with separate circuit boards for an antenna and display device.

Nelson merely states that the display screen is controlled by a graphics circuit.<sup>1</sup> Nelson fails to describe the mounting of a display screen on any circuit board, let alone a second circuit board distinct and separate from the antenna driver circuit board 34. It does not necessarily follow, then, that the display screen is mounted on a circuit board separate from the antenna driver circuit board 34. The Nelson reference does not even disclose two circuit boards mounted within a programmer housing, as required by claim 1.

Nelson completely lacks any disclosure that teaches or suggests that its display screen is mounted on a separate circuit board from that of an internal antenna. As described in further detail below, Nelson does not even contemplate the use of an internal antenna, but only describes an external antenna. Given the lack of disclosure in Nelson, the Office Action appears to be relying on an improper finding of inherent disclosure in Nelson to support the rejection of claim 1. The fact that a certain characteristic may be present in the prior art is not sufficient to establish the inherency of that result or characteristic.<sup>2</sup> The Office Action must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.<sup>3</sup> No reasonable support has been provided for the determination that an antenna and display screen in Nelson are necessarily mounted on first and second circuit boards, respectively.

Furthermore, in the Nelson disclosure, an external telemetry antenna 24 is coupled to the transceiver 86, rather than an internal antenna, as recited by Applicant's claim 1.<sup>4</sup> Nothing in

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<sup>1</sup> Nelson at col. 12, ll. 15-18.

<sup>2</sup> *In re Rijkkaert*, 9 F.3d 1531, 1534, 28 USPQ.2d 1955, 1957 (Fed. Cir. 1993); MPEP 2112.

<sup>3</sup> *Ex parte Levy*, 17 USPQ.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original); MPEP 2112.

<sup>4</sup> Nelson at col. 11, ll. 52-55

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Nelson even suggests a programmer with an internal antenna, much less an internal antenna and display mounted on separate circuit boards. Thus, a person having ordinary skill in the art who was consulting Nelson at the time the current invention was made would have had no reason to modify the disclosure of Nelson with the internal antenna and ground plane layer interrupted by gaps disclosed by Maoz. Nelson provides no indication that the external RF antenna is disadvantageous in any way. In fact, Nelson states, "[t]elemetry antenna 24 is generally telescoping and may be adjustable on the case of programmer 20."<sup>5</sup> The telescoping nature of the antenna provides the benefit that it is not necessary to place the external RF telemetry antenna close to the patient's skin overlying an IMD. Instead, the external RF telemetry antenna may be located a few feet to a few meters or so away from the patient.<sup>6</sup> An internal antenna would not provide this telescoping benefit, and is thus discouraged by Nelson.

Additionally, the use of an external antenna allows the placement of the antenna away from interference-generating electronics within the programmer housing, such as the display. Thus, signal interference is decreased, which reduces or even eliminates the need for interference-reducing measures, such as the plurality of gaps in the substantially contiguous ground plane layer included in the first circuit board. Accordingly, it is unclear why one skilled in the art would have looked to modify the Nelson device that includes an external antenna to include the internal antenna and ground plane with slots of Maoz.

The Office Action fails to identify any teaching in the prior art of a motivation to combine the teaching of the applied references. Specifically, the Office Action has not identified any motivation found within the prior art that teaches the replacement of the external antenna of Nelson with the internal antenna and ground plane layer with gaps of Maoz. While the Office Action states:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the programmer as taught by Nelson, with programmer with an internal antenna and gaps on the circuit board as taught by Maoz, since such a modification would provide the programmer with an internal antenna and a ground plane layer that in disrupted by gaps for providing increased power without internal noise.<sup>7</sup>

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<sup>5</sup> *Id.* at col. 9, ll. 49-51.

<sup>6</sup> *Id.* at col. 9, ll. 48-54 and col. 11, ll. 15-31.

<sup>7</sup> Office Action at page 4, item 9 (emphasis added).



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the Office Action seems to have pulled the supposed motivation to combine these references out of Applicant's specification, which is impermissible.<sup>8</sup> It is improper to point to teachings of motivation contained within Applicant's own disclosure.<sup>9</sup> The rejection of the claims must be based on substantial evidence in the record demonstrated that the motivation for making the claimed invention resides in the prior art.<sup>10</sup>

The skilled person, without access to Applicant's disclosure, would not have appreciated the advantages of a programmer including a display and internal antenna mounted on separate circuit boards, as defined by Applicant's claim 1, much less a circuit board on which an internal antenna is mounted, where the circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps. In particular, Nelson et al. and Maoz do not contemplate that such an arrangement can be effective in achieving a reduction in electrical and electromagnetic interference during telemetry sessions using the internal antenna. This is especially true because Nelson et al. does not even disclose a programmer with an internal antenna, and therefore has no regard for the interference problems posed by such an arrangement. Furthermore, it is unclear why one skilled in the art, looking to modify Nelson, which does not even disclose an internal antenna, would have looked to Maoz, which relates to mobile communication apparatuses, such as a mobile telephone<sup>11</sup>, and does not even contemplate the application of its device to a medical device programmer.

As described in Applicant's disclosure, it is desirable to integrate the antenna and display within the programmer housing for purposes of compactness.<sup>12</sup> Yet, when the display and internal antenna are located near each other, poor communication between an implantable medical device and the programmer can result from a number of electronic issues, such as interference caused by the display.<sup>13</sup> With separate circuit boards, the internal antenna can be physically displaced from the display, significantly reducing electrical noise. In this manner, the placement of the antenna and display on separate circuit boards, and the resulting separation

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<sup>8</sup> See *Interconnect Planning Corp. v. Feil*, 227 USPQ 543 (CAFC 1985); see also *In re Fine*, 5 USPQ.2d 1596, 1598 (CAFC 1988); see also *In re Gorman*, 18 USPQ.2d 1885, 1888 (CAFC 1991); see also *Al-Site Corp. v. VSI International, Inc.*, 50 USPQ.2d 1161, 1171 (CAFC 1999).

<sup>9</sup> *In re Oetiker*, 24 USPQ.2d at 1445.

<sup>10</sup> *In re Lee*, 61 USPQ.2d 1430, 1433 (Fed. Cir. 2002); *In re Chu*, 36 USPQ.2d at 1094.

<sup>11</sup> Maoz et al. at paragraph [0001].

<sup>12</sup> Applicant's disclosure at paragraph [0009].

<sup>13</sup> *Id.*

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distance, can support more reliable telemetry in a medical device programmer while achieving a programmer with reduced size and compactness. The cited art fails to recognize this advantage.

In summary, the Office Action's conclusion of obviousness, and particularly the cited motivation to replace the external antenna of Nelson with the internal antenna and ground plane layer with gaps of Maoz, is unsupported by any substantial evidence in the record. The remaining cited reference, i.e., Stein, fails to teach or suggest the elements of Applicant's claims 1. Applicants do not admit or acquiesce in the legitimacy of the Stein reference as prior art against the claimed invention, and reserve the right to dispute the prior art status of the Stein reference in any future communication. In view of the structural differences between the invention defined by independent claim 1 and the Stein device, however, Applicants reserve further comment at this time.

Claims 2-10 and 21 are dependent on claim 1 and are thus in condition for allowance. Claims 2-10 and 21 are also patentable over the cited references. Applicant addresses some of the dependent claims below for purposes of illustration.

The Office Action rejected claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1 above, and further in view of Carburaru. Initially, Applicant notes that claim 5 is dependent on independent claim 1 and is thus in condition for allowance for at least the reasons discussed above with respect to claim 1.

Claim 5 further recites that the first circuit board of claim 1 includes an electrostatic discharge layer defining a peripheral conductive layer and a central aperture. The Office Action asserted that Carburaru discloses that printed circuit boards utilized in medical devices may contain electrostatic discharge layers built into them. The Office Action concluded that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the circuit board of Nelson in view of Maoz with a printed circuit board with a static discharge layer as taught by Carburaru since it would provided the device with a protection circuit to prevent circuit failure due to electrostatic discharge.

Applicant respectfully disagrees with the Office Action's conclusion of obviousness. Carburaru makes a single statement regarding electrostatic discharge circuits. Namely, at paragraph [0070], Carburaru describes FIG. 3A and states, "[a]dditionally, the [printed circuit board] may contain electrostatic discharge (ESD) protection circuits 471, 472, 473, and 474 that

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are only active when electrostatic discharge is present.” Carbunaru provides no further details regarding the construction or implementation of the electrostatic discharge circuits. For example, Carbunaru fails to disclose or suggest that the ESD circuit is an ESD layer defining a peripheral conductive layer and a central aperture, as required by Applicant’s claim 5. Carbunaru only shows its ESD circuits in FIG. 3A, which is a “schematic diagram representing the electrical circuitry of the chair pad.”<sup>14</sup> As suggested by Applicant’s disclosure, this arrangement may provide advantages. For example, this arrangement may substantially reduce the magnetic load to the magnetic circuit of antenna.<sup>15</sup> Carbunaru fails to consider or appreciate the advantages of this arrangement and provides no disclosure or suggestion that this arrangement is desirable.

It is also unclear why one skilled in the art looking to modify the programmer of Nelson would have looked to a chair pad for charging an implantable stimulator<sup>16</sup> described by Carbunaru to include ESD protection circuits. The Carbunaru ESD protection circuits are not used to prevent failure of an antenna circuit board, but a circuit board of an implantable stimulator charging stimulator. Carbunaru does not contemplate application of its ESD protection circuits to any other device, much less an antenna circuit board of a medical device programmer. The Office Action cites to no motivation found within the cited references for applying the ESD protection circuits to an antenna circuit board or modifying an ESD layer to define a peripheral conductive layer and a central aperture.

With respect to claim 6, which depends from claim 5, the Office Action found that, “because the layers are throughout the entire circuit board it would be obvious that the electrostatic discharge layer would be the approximate size and shape of the antenna.”<sup>17</sup> Applicant respectfully disagrees. Claim 6 specifies that the internal antenna of claim 1 defines an aperture, and that the central aperture of the ESD layer substantially approximates the size and shape of the aperture of the internal antenna. The Office Action appears to have disregarded the requirement that a central aperture of the ESD layer substantially approximates the size and shape of an aperture of the internal antenna.

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<sup>14</sup> Carbunaru at paragraph [0026].

<sup>15</sup> *Id.* at paragraph [0029].

<sup>16</sup> *Id.* at paragraph [0070].

<sup>17</sup> Office Action at page 5, item 14.

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The cited references do not teach or suggest the elements of claim 6. First, as described above, Carbunaru does not contemplate application of its ESD protection circuits to a circuit board for an internal antenna. Second, none of the cited references teaches or suggests an antenna defining an aperture. Nelson does not teach or suggest a programmer including an internal antenna, and neither Maoz nor Carbunaru describe the configuration of their respective internal antennas. Third, even if the ESD protection circuits are "throughout the entire circuit board," as proposed by the Office Action without any offered support, which Applicant disagrees with, the Office Action offers absolutely no support for the assertion that the ESD circuits define a central aperture or that the central aperture of the ESD circuits substantially approximates a size and shape of the antenna aperture, as required by claim 6. The Office Action does not even address this element of Applicant's claims 5 and 6.

With respect to the rejection of claim 7, which depends from claim 5 and states that the electrostatic discharge layer is a first electrostatic discharge layer formed on a first side of the ground plane layer, and the programmer further comprises a second electrostatic discharge layer formed on second side of the ground plane layer, the Office Action found that "[i]t would have been an obvious matter of design choice" to modify the circuit board of Nelson in view of Maoz in further view of Carbunaru with dual layers of electrostatic discharge.<sup>18</sup> The Office Action also supports its rejection of claim 7 with the assertion that "[o]ne of ordinary skill in the art . . . would have expected Applicant's invention to perform equally well with a single layer as taught by Nelson in view of Maoz in further view of Carbunaru."<sup>19</sup> If the Office Action is relying on an assertion of equivalence to support the obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on Applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents.<sup>20</sup> Applicant respectfully requests the Office Action to provide evidence to support the assertion of equivalence or withdraw the rejection of claim 7.

As the Office Action appears to have recognized, the cited art fails to teach or suggest a first electrostatic discharge layer formed on a first side of the ground plane layer, and a second electrostatic discharge layer formed on second side of the ground plane layer, as recited by claim

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<sup>18</sup> Office Action at page 6, item 14.

<sup>19</sup> *Id.*

<sup>20</sup> MPEP 2144.05, citing *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958)



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7. While the Office Action relies on "design choice" to support the rejection of claim 7, which Applicant disagrees with, the Office Action has failed to address how the prior art discloses or suggest an ESD layer on a ground plane layer. Nothing in the cited references even teaches or suggests placing an ESD layer on a ground plane layer.

For at least these reasons, the Office Action has failed to establish a prima facie case for non-patentability of Applicant's claims 1-10 and 21 under 35 U.S.C. § 103(a). Withdrawal of the rejection of claims 1-10 and 21 under 35 U.S.C. § 103(a) is respectfully requested.

***Claim 23-32***

The Office Action rejected claims 23-29 and 32 under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 1, in further view of Carburaru. Applicant respectfully traverses the rejection of claim 23 under 35 U.S.C. § 103(a). Claims 30 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nelson in view of Maoz as applied to claim 23, in further view of Stein. Applicant respectfully disagrees with the rejections.

Claim 23 as amended is directed to a programmer for an implantable medical device. The programmer includes an internal antenna mounted on a first circuit board within a programmer housing, where the internal antenna has a loop-like structure and defines a first aperture, and the first circuit board includes at least one signal plane with an electrostatic discharge layer defining a second aperture in substantially overlapping alignment with the first aperture. The programmer further includes a display device mounted on a second circuit board within the programmer housing. Additionally, the first circuit board includes a substantially contiguous ground plane layer interrupted by a plurality of gaps.

For similar reasons described above with respect to claims 1 and 5, the cited references fail to teach or suggest each and every element of independent claim 23. Claims 24-32 depend from claim 23, and are in condition for allowance for at least the reasons described above with respect to claims 1 and 5. For at least these reasons, the Office Action has failed to establish a prima facie case for non-patentability of Applicant's claim 23-32 under 35 U.S.C. § 103(a). Withdrawal of this rejection is respectfully requested.

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### CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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By:

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